

## CLAIMS

1           1.       A method of leaching low sulphur content ores to release metal  
2 values, comprising:

3           preconditioning finely ground elemental sulphur with bacteria,  
4 comprising *Thiobacillus thiooxidans*, in a biological reactor so that the  
5 hydrophobic sulphur becomes wetted and the bacteria attach themselves to the  
6 sulphur surfaces; and

7           agglomerating the preconditioned sulphur particles throughout a  
8 leaching heap with the low sulphur content ores to release metal values.

1           2.       The method of claim 1 wherein the bacteria further include  
2 *Thiobacillus ferrooxidans*.

1           3.       The method of claim 1 wherein said finely ground sulphur is  
2 produced by rod milling sulphur.

1           4.       The method of claim 3 wherein the sulphur is rod milled such  
2 that 1.9 kilograms of sulphur in 1 liter of water for 15 minutes produces a  
3 product of approximately 50% -400 mesh.

1           5.       The method of claim 1 further including adding a bacteria  
2 nutrient to the preconditioning process.

1           6.       The method of claim 1 further including adding *Thiobacillus*  
2   *ferrooxidans* to the agglomerated leaching heap.

1           7.       The method of claim 1 wherein the preconditioning process is  
2   conducted for 12-48 hours.

1           8.       The method of claim 1 further including adding acidic bioleach  
2   solution produced during the preconditioning process to the ore during  
3   agglomeration to partially satisfy the acid demand of the ore.

1           9.       The method of claim 1 further including adding acid bioleach  
2   solution produced during preconditioning to the leach solution reservoir to  
3   partially satisfy the acidic demand of the ore.

1           10.      The method of claim 6 including controlling the pH in the heap  
2   in the range of 1.8-2.4 so that the *Thiobacillus ferrooxidans* can rapidly oxidize  
3   any metal sulphides present in the ore.